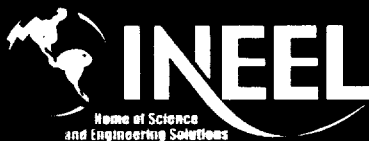


**DOE/ID 10770**  
**Revision 3**  
**September 2003**  
**Project Nos. 020978 and 023614**



U.S. Department of Energy  
Idaho Operations Office

# **Waste Management Plan for INTEC Operable Unit 3-13, Group 1, Tank Farm Interim Action, Phases I and II**



Idaho National Engineering and Environmental Laboratory

**Waste Management Plan for INTEC Operable  
Unit 3-13, Group 1, Tank Farm Interim Action,  
Phases I and II**

**September 2003**

**Prepared for the  
U.S. Department of Energy  
Idaho Operations Office**

## ABSTRACT

This Waste Management Plan describes waste characterization, management, and minimization activities for the Operable Unit 3-13, Group 1, Tank Farm Interim Action, Phases I and II to be performed at the Idaho National Engineering and Environmental Laboratory. The waste management activities described in this plan support the selected interim action presented in *Final Record of Decision for Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13*. This plan identifies the waste streams that will be generated, provides guidance for characterizing the wastes, and details plans for the management and disposition of wastes resulting from implementation of Phases I and II of the interim action.



# CONTENTS

ABSTRACT .....	iii
ACRONYMS .....	ix
1. INTRODUCTION .....	1-1
1.1 Purpose and Objectives .....	1-1
2. SITE BACKGROUND AND FACILITY DESCRIPTION .....	2-1
3. WASTE IDENTIFICATION .....	3-1
4. WASTE CHARACTERIZATION .....	4-1
4.1 Existing Characterization Data .....	4-1
4.2 Project Organization and Responsibilities .....	4-2
4.2.1 Project Manager/Work Requester .....	4-2
4.2.2 Sampling Coordinator .....	4-2
4.2.3 Field Team Leader/Job Site Supervisor .....	4-2
4.2.4 Characterization Specialists .....	4-2
4.2.5 Waste Generator Services—Waste Technical Specialist .....	4-3
4.2.6 Sample and Analysis Management—Technical Representative .....	4-3
4.2.7 ESH&QA Support .....	4-3
4.2.8 Data Storage Administrator .....	4-3
5. SAMPLING DATA QUALITY OBJECTIVES .....	5-1
5.1 Problem Statement .....	5-1
5.2 Decision Statements .....	5-1
5.3 Decision Inputs .....	5-2
5.3.1 Information Required to Resolve Decision Statements .....	5-2
5.3.2 Computational and Survey/Analytical Methods .....	5-3
5.3.3 Analytical Performance Requirements .....	5-3
5.4 Study Boundaries .....	5-4
5.5 Decision Rule .....	5-4
5.6 Decision Error Limits .....	5-5
6. DESIGN BASIS .....	6-1
6.1 Technical Factors of Importance in Design .....	6-1
6.2 Characterization Approach .....	6-1

6.2.1	Excess Soil .....	6-2
6.2.2	Construction Debris .....	6-4
6.2.3	Sample Analytical Requirements.....	6-4
7.	SAMPLE DESIGNATION.....	7-1
7.1	Sample Identification Code.....	7-1
7.2	Sample and Analysis Plan Table/Database .....	7-1
7.2.1	Sample Description Fields.....	7-1
7.2.2	Sample Location Fields .....	7-2
7.2.3	Analysis Type .....	7-3
8.	SAMPLING PRACTICES .....	8-1
8.1	Sample Location Surveys .....	8-1
8.2	Sample Screening .....	8-1
8.3	Field Decontamination .....	8-1
8.4	Handling and Disposition of Sampling Waste .....	8-1
8.5	Waste Minimization and Segregation.....	8-2
9.	DOCUMENTATION MANAGEMENT AND SAMPLE CONTROL .....	9-1
9.1	Documentation.....	9-1
9.1.1	Sample Container Labels.....	9-1
9.1.2	Field Guidance Forms .....	9-1
9.1.3	Sample Logbooks .....	9-2
9.1.4	Field Team Leader's Daily Logbook .....	9-2
9.2	Sample Equipment and Handling .....	9-3
9.2.1	Sample Equipment .....	9-3
9.2.2	Sample Containers .....	9-5
9.2.3	Sample Preservation.....	9-5
9.2.4	Chain of Custody .....	9-5
9.2.5	Transportation of Samples (On-Site and Off-Site) .....	9-6
10.	WASTE MANAGEMENT REQUIREMENTS .....	10-1
10.1	Remediation Waste .....	10-1
10.2	Waste Minimization and Segregation .....	10-1

10.3	Waste Management and Disposition.....	10-1
10.3.1	Soils .....	10-2
10.3.2	Industrial Waste .....	10-2
10.3.3	Low-Level Waste .....	10-3
10.3.4	Hazardous Waste .....	10-3
10.3.5	Mixed Low-Level Waste .....	10-3
10.3.6	New Waste Streams .....	10-3
11.	MANAGEMENT AND DISPOSITION OF WASTE .....	11-1
11.1	Packaging .....	11-1
11.2	Labeling .....	11-1
11.3	Storage and Inspection .....	11-1
12.	TRACKING, REPORTING, AND RECORDKEEPING.....	12-1
13.	REFERENCES.....	13-1
Appendix A.	Sampling and Analysis Plan Table .....	A-1

## FIGURES

2-1.	INEEL location map .....	2-2
2-2.	Tank farm area .....	2-3
11.1.	Cross section of typical waste staging pile .....	11-2

## TABLES

3-1.	Waste management during TFIA remediation activities .....	3-2
5-1.	Required information and reference sources .....	5-2
5-2.	Information required to resolve the decision statements .....	5-3
5-3.	Analytical performance requirements .....	5-3
5-4.	Decision rules .....	5-4
6-1.	Protocol for soils sampling inside the tank farm .....	6-2
6-2.	Data quality summary table for the soil and debris wastes .....	6-3
6-3.	Analytical methods for contaminants .....	6-3
9-1.	Sampling bottles, preservation types, and holding times .....	9-5



## ACRONYMS

AA	alternative action
ALARA	as low as reasonably achievable
AOC	area of contamination
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFA	Central Facilities Area
CPP	Chemical Processing Plant
DOE	Department of Energy
DOT	Department of Transportation
DQO	data quality objective
DS	decision statement
EPA	Environmental Protection Agency
ESH&QA	environment, safety, health, and quality assurance
FFA/CO	Federal Facility Agreement and Consent Order
FTL	field team leader
GFP	gas flow proportional
HASP	Health and Safety Plan
HDPE	high-density polyethylene
HI	hazard index
HW	hazardous waste
HWD	hazardous waste determination
ICDF	INEEL CERCLA Disposal Facility
ID	identification
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory

INTEC	Idaho Nuclear Technology and Engineering Center
IW	industrial waste
IWTS	Integrated Waste Tracking System
<b>JJS</b>	job site supervisor
LLW	low-level waste
MLLW	mixed low-level waste
OSHA	Occupational Safety and Health Administration
<b>Ou</b>	operable unit
PM	project manager
PPE	personal protective equipment
PS	problem statement
PSQ	principal study question
QA/QC	quality assurance/quality control
QAPjP	Quality Assurance Project Plan
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RD/RA	remedial design/remedial action
ROD	Record of Decision
SAM	Sample and Analysis Management
SAP	Sample and Analysis Plan
SSA	Staging and Storage Annex
SVOC	semivolatile organic compound
TAL	total analyte list
TFIA	Tank Farm Interim Action
TRU	transuranic

UTS	Universal Treatment Standard
VOC	volatile organic compound
WAC	Waste Acceptance Criteria
WAG	waste area group
WGS	Waste Generator Services
WMP	Waste Management Plan
WP	work plan
WTS	waste technical specialist



# **Waste Management Plan for INTEC Operable Unit 3-13, Group 1, Tank Farm Interim Action, Phases I and II**

## **1. INTRODUCTION**

This Waste Management Plan (WMP) describes waste characterization, management, and minimization of all wastes generated during the Operable Unit (OU) 3-13, Group 1, Tank Farm Interim Action (TFIA) at the Idaho National Engineering and Environmental Laboratory (INEEL), Idaho Nuclear Technology and Engineering Center (INTEC), Waste Area Group (WAG) 3. This interim remedial action is being performed to implement the remedies identified in the Final Record of Decision (ROD) for OU 3-13 (DOE-ID 1999). The actions are being performed under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC § 9601 et seq.), as implemented by the Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991).

The primary objectives of this WMP are to ensure wastes are properly characterized and managed during activities associated with the TFIA activities. This plan provides identification of each of the waste streams, guidance for characterizing the wastes, describes waste minimization actions, and provides the requirements for waste transportation and dispositioning. The interim action consists of two phases.

Phase activities are defined as:

- Phase I—Complete and put into operation the following work outside the tank farm fence: lining ditches, culvert installation, and lining the evaporation pond.
- Phase II—Place an infiltration barrier over the affected areas of release sites CPP-28, CPP-31, and CPP-79 in the tank farm. Add drainage control functions to improve the surface grade of the selected sites to allow for surface water flow to the Phase I drainage system.

The remediation activities covered under Phase I and II for the tank farm will occur in three locations within the area of contamination (AOC) described in the ROD: (1) inside the tank farm fence, (2) outside of the tank farm fence and inside the INTEC fence, and (3) outside of the INTEC fence. This WMP addresses wastes generated from each of these locations.

### **1.1 Purpose and Objectives**

This WMP is intended to provide a management and planning tool for identifying and managing the waste streams generated from the TFIA remediation activities and addresses waste characterization requirements of the Hazardous Waste Management Act (HWMA 1983), Idaho Administrative Procedures Act (IDAPA) 58.01.05.006 (40 CFR 262.11). Data gathered through implementation of this plan will be used to determine if soils can be reused as demonstrated by meeting the OU 3-13 remedial action objectives (RAOs), to make hazardous waste (HW) determinations, and to make decisions about the proper management and disposal of the wastes.



## **2. SITE BACKGROUND AND FACILITY DESCRIPTION**

The INEEL is a government facility managed by the Department of Energy (DOE) located 51.5 km (32 mi) west of Idaho Falls, Idaho. It occupies 2,305 km<sup>2</sup> (890 mi<sup>2</sup>) of the northeastern portion of the Eastern Snake River Plain. INTEC is located in the south-central portion of the INEEL as shown in Figure 2-1.

INTEC began operating in 1952. The primary missions were reprocessing uranium for defense purposes and researching and storing spent nuclear fuel. Irradiated defense nuclear fuels were reprocessed to recover unused uranium. In 1992, the reprocessing mission was phased out. The current INTEC mission is receiving and temporarily storing spent nuclear fuel and radioactive wastes for future disposition.

The INTEC tank farm consists of 15 underground tanks ranging in volume from 69,644 to 1,135,500 L (18,400 to 300,000 gal). The tops of the tanks are located approximately 3.1 m (10 ft) below ground surface, with the bases located to depths of up to approximately 15.2 m (50 ft) below ground surface.

The tank farm soils area (shown in Figure 2-2) previously consisted of sites in OUs 3-06, 3-07, 3-08, 3-11, and 3-13. The sites are located in the area of the tank farm (sites CPP-16, -20, -24, -25, -26, -28, -30, -31, -32, and -79) and adjacent to the Process Equipment Waste Evaporator Building (sites CPP-15, -27, -33, and -58) and are now consolidated into site CPP-96. These sites consist of soil contamination that resulted from spills and pipeline leaks of radioactive liquids from plant liquid transfer operations. Distributed throughout the tank farm soils outside of the previously identified release sites are low concentrations of contaminants at varying locations and depths. New site CPP-96 is a consolidation of all the previously identified tank farm soil sites and the intervening interstitial soils within the site CPP-96 boundary. No evidence has been found to indicate that any of the tanks have leaked; however, contaminants found in the interstitial soils are likely the result of accidental releases and leaks from process piping valve boxes or sumps and cross-contamination from operations and maintenance excavations. Limited site investigations have been conducted at the tank farm sites because many of the spill areas are in operational and highly radioactive areas.

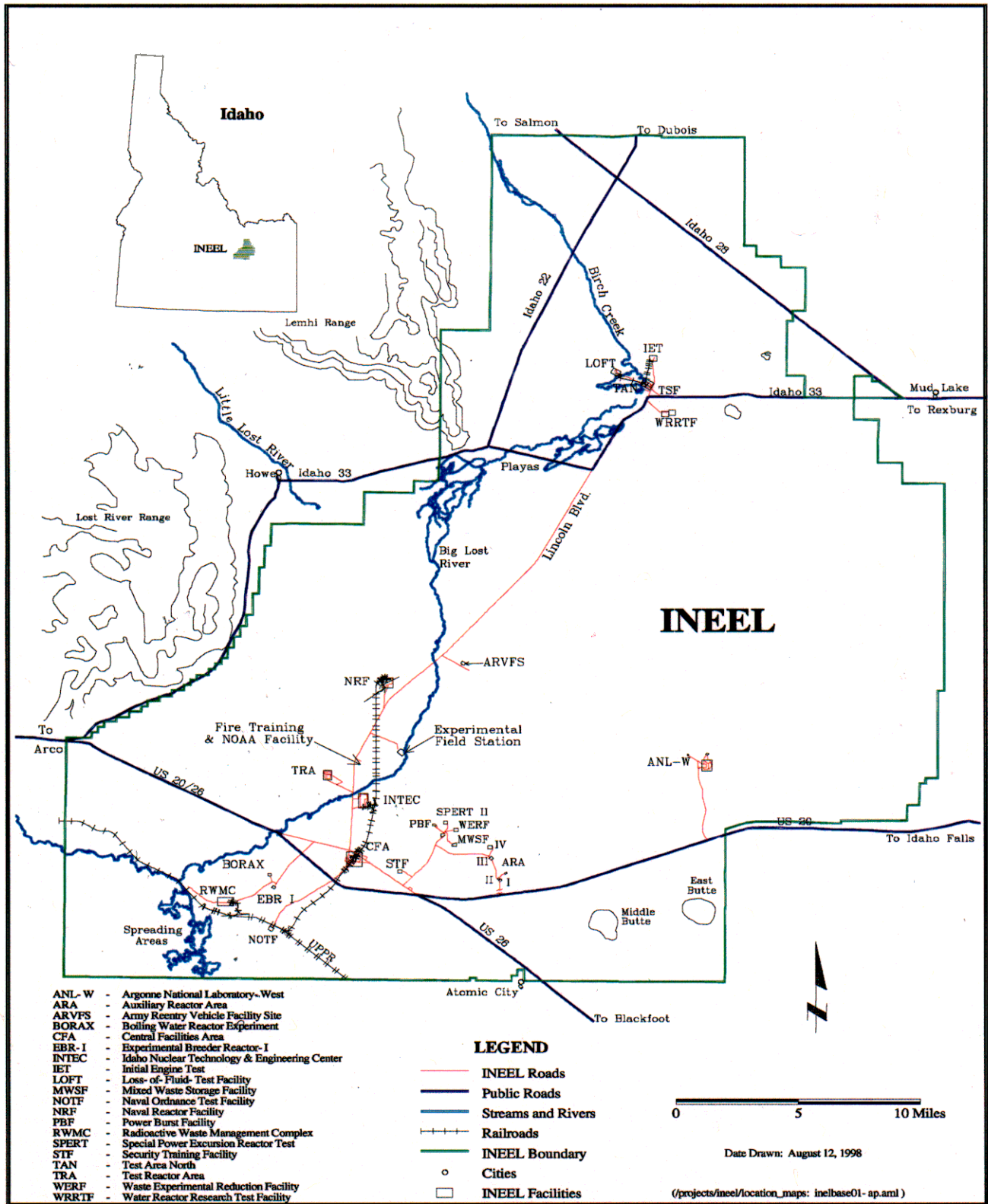


Figure 2-1. INEEL location map.

**Figure 2-2. Tank farm area.**



### **3. WASTE IDENTIFICATION**

The waste streams anticipated to be generated from the TFIA are industrial, low-level, hazardous, and mixed low-level waste (MLLW). However, all waste streams will be characterized as required by DOE orders and in accordance with 40 CFR 262.11. Hazardous waste determinations (HWDs) will be performed on all waste streams.

Table 3-1 identifies and describes the waste types that may be generated as a result of TFIA remediation activities, management strategies, and the proposed disposition of each waste type.

Table 3-1. Waste management during TFIA remediation activities

Waste Type	Description	Management Strategy	Disposition"
Industrial waste (IW)	<p>Solid waste generated by industrial processes, manufacturing, and support processes (40 CFR 243). Certain wastes, such as nontraining-related personal protective equipment (PPE), petroleum-contaminated material such as soil, sand, gravel, or other earthen material, engine oil filters, etc., require a waste-stream-specific, documented waste determination per the <i>INEEL Waste Acceptance Criteria</i> (WAC) (DOE-ID 2003a).</p> <p>Activities that may generate IW include administrative activities, sampling, and cleanup (e.g., petroleum spills).</p>	<p>All wastes must be characterized, documented, and tracked if necessary as described in this WMP.</p> <p>IW will be transported to the Central Facilities Area (CFA) landfill for disposal. Recyclable and reusable items will be managed under this WMP and the INEEL WAC.</p> <p>Requirements for disposal (described in the INEEL WAC) must be met.</p>	INEEL Landfill Complex (at CFA) or recycled/reused under the INEEL WAC and this WMP.
Low-level waste (LLW)	<p>Waste that is not high-level radioactive waste, spent nuclear fuel, transuranic (TRU) waste, by-product or naturally occurring radioactive material.</p> <p>LLW may include (but is not limited to) solid sampling and monitoring materials, tarps, and other material from staging activities, equipment that cannot be decontaminated, and other radiologically contaminated materials such as petroleum-contaminated media (i.e., soil or other absorbent materials containing radiological- and petroleum-contaminated materials).</p> <p>Activities that may generate LLW include sampling and monitoring, remediation activities, and decontamination.</p>	<p>All wastes must be characterized, documented, and tracked as described in this WMP.</p> <p>If necessary, solid and liquid waste streams will be staged and managed in accordance with this WMP.</p>	<p>ICDF landfill or evaporation pond.</p> <p>Solid waste will be disposed of at the ICDF landfill. In the event solid wastes do not meet the ICDF landfill WAC, the wastes will be containerized, treated, and/or stored at the ICDF as necessary or required until appropriate on-Site or off-Site treatment, storage, or disposal is arranged.</p>

Table 3-1. (continued)

Waste Type	Description	Management Strategy	Disposition"
Hazardous waste (HW)	<p>Waste designated as hazardous by the Environmental Protection Agency regulations (40 CFR 261.3) and regulated under the RCRA.</p> <p>HW streams may include (but are not limited to) materials that are determined hazardous based on process knowledge, materials from sampling activities, remediation activities, decontamination materials, and materials used during sampling activities.</p>	<p>All wastes must be characterized, documented, and tracked as described in this WMP.</p> <p>If necessary, solid and liquid waste streams will be staged and managed in accordance with this WMP.</p>	<p>Liquid wastes will be disposed of at the ICDF evaporation pond if they meet the ICDF evaporation pond WAC. If they do not meet the ICDF evaporation pond WAC, an alternate disposal facility will be determined</p> <p>ICDF landfill or evaporation pond.</p> <p>Solid waste will be disposed of at the ICDF landfill. In the event solid wastes do not meet the ICDF landfill WAC, the wastes will be containerized, treated, and/or stored at the ICDF as necessary or required until appropriate on-Site or off-Site treatment, storage, or disposal is arranged.</p> <p>Liquid wastes will be disposed of at the ICDF evaporation pond if they meet the ICDF evaporation pond WAC. If they do not meet the ICDF evaporation pond WAC, an alternate disposal facility will be determined</p>

Table 3-1. (continued)

Waste Type	Description	Management Strategy	Disposition"
MLLW	<p>Waste containing both radioactive and RCRA-hazardous components.</p> <p>MLLW streams may include (but are not limited to) materials from sampling activities, decontamination materials, petroleum-contaminated materials from remediation activities, tank, sediment, piping, and soil.</p>	<p>All wastes must be characterized, documented, and tracked if necessary as described in this WMP.</p> <p>If necessary, solid and liquid waste streams will be staged and managed in accordance with this WMP.</p>	<p>ICDF landfill or evaporation pond</p> <p>Solid waste will be disposed of at the ICDF landfill. In the event solid wastes do not meet the ICDF landfill WAC, the wastes will be containerized, treated, and/or stored at the ICDF as necessary or required until appropriate on-Site or off-Site treatment, storage, or disposal is arranged.</p> <p>Liquid wastes will be disposed of at the ICDF evaporation pond if they meet the ICDF evaporation pond WAC. If they do not meet the ICDF evaporation pond WAC, an alternate disposal facility will be determined.</p>
Polychlorinated biphenyl waste	Waste managed strictly under Toxic Substances Control Act regulations, as applicable.	<p>All wastes must be characterized, documented, and tracked as described in this WMP.</p> <p>If necessary, solid waste streams will be staged and managed in accordance with this WMP.</p>	<p>ICDF landfill or INEEL landfill.</p> <p>In the event a waste stream does not meet the ICDF landfill WAC, the waste will be containerized, treated, and/or stored at the ICDF as necessary or required until appropriate on-Site or off-Site treatment, storage, or disposal is arranged.</p>
<p>a. Most IW will be sent to the landfill at the CFA for disposal (subject to meeting the INEEL WAC). IW that does not meet the INEEL WAC will be managed at the ICDF Complex under this WMP.</p>			

## 4. WASTE CHARACTERIZATION

Waste generated during the TFIA remedial action will be characterized and a HWD performed per applicable RCRA regulations (40 CFR 262.11). As outlined in Section 3, preliminary classifications have been made of anticipated waste types based on process knowledge regarding the source(s) of the expected waste. Subsequent to generation, a portion or all of the waste may be reclassified. Prior to ultimate disposal, waste may be further characterized, as detailed in the *ICDF Complex Waste Verification Sampling and Analysis Plan* (DOE-ID 2003b), to ensure compliance with the ICDF landfill (DOE-ID 2003c) or evaporation pond (DOE-ID 2003d) WAC or by means specified by off-Site disposal facilities for compliance with the applicable WAC. Appropriate and required documentation of waste characterization will be completed.

### 4.1 Existing Characterization Data

Based on the construction design drawings for TFIA Phase I and II, the remedial action activities could disturb soils and materials in environmentally controlled areas CPP-14, CPP-15, CPP-16, CPP-26, CPP-27, CPP-28, CPP-31, CPP-36, CPP-37b, CPP-37c, CPP-58, and CPP-79. Contamination of these sites was caused by past releases of radioactive and hazardous materials. The contaminants of concern for OU 3-13 release sites as identified in *Final Record of Decision, Idaho Nuclear Technology and Engineering Center* (DOE-ID 1999) are as follows:

1. Am-241
2. Cs-137
3. Eu-152
4. Eu-154
5. Pu-238
6. Pu-239/240
7. Pu-241
8. Sr-90
9. Mercury.

An impermeable liner with a clean sand and gravel buffer layer were installed over tank farm soils after the known releases occurred. A portion of this sand and gravel buffer will be removed without breaching the liner to accommodate asphalt covers over release sites CPP-28, -31, and -79. Additional activities at other locations as outlined in the Scope of Work will occur to support construction of surface drainage ditches, installation of underground piping, construction of headwalls and endwalls, and lining an evaporation pond. Waste materials from these construction activities could contain the soil risk-based contaminants from the OU 3-13 ROD.

## **4.2 Project Organization and Responsibilities**

The following sections contain a description, based on job title, of each of the personnel associated with this field project.

### **4.2.1 Project Manager/Work Requester**

The project manager (PM)/work requestor will ensure that all activities conducted during the project comply with INEEL management control procedures, program requirements documents, and all applicable requirements of Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), DOE, Department of Transportation (DOT), and the State of Idaho. The PM coordinates all document preparation, field and laboratory activities, data evaluation, risk assessment, dose assessment, and design activities. The PM is responsible for the overall work scope, schedule, and budget.

The PM is responsible for the field activities and for all personnel (including craft personnel) assigned to work at the project location. The PM will serve as the interface between operations and project personnel and will work closely with the sampling team at the site to ensure that the objectives of the project are accomplished in a safe and efficient manner. The PM will work with all other identified project personnel to accomplish day-to-day operations, identify and obtain additional resources needed at the site, and interact with environment, safety, health, and quality assurance (ESH&QA) personnel on matters regarding health and safety.

### **4.2.2 Sampling Coordinator**

The INEEL sampling coordinator is responsible to coordinate all sampling activities across the INEEL Site. Upon notification by the PM, the sampling coordinator is responsible to obtain and schedule the necessary resources to complete the sampling task. The sampling coordinator will schedule sampling personnel to complete the task. The sampling coordinator is also responsible to manage and obtain sampling supplies and tools needed to complete the task.

### **4.2.3 Field Team Leader/Job Site Supervisor**

The field team leader (FTL) or job site supervisor (JSS) will be the INEEL representative at the site with responsibility for the safe and successful collection of samples. The FTL/JSS acts as the team leader and works with INEEL facility personnel, ESH&QA personnel, and the field sampling team to manage field sampling operations and to execute the characterization plan. The FTL/JSS enforces site control, documents activities, and may conduct the daily safety briefings at the start of the shift. Health and safety issues may be brought to the attention of the FTL.

If the FTL/JSS leaves the site during sampling operations, an alternate will be appointed to act as the FTL/JSS. The identity of the acting FTL/JSS will be conveyed to sampling personnel at the sampling location, recorded in the logbook, and communicated to the facility representative, when appropriate.

### **4.2.4 Characterization Specialists**

Characterization specialists include all task site personnel assigned to the characterization project to obtain samples for analytical purposes. All persons, including INEEL, DOE, and subcontractor personnel who collect samples must understand and comply with the requirements of this document and other applicable documentation. Characterization specialists will be briefed at the start of each shift by the FTL/JSS regarding the tasks to be performed and the applicable health and safety requirements. During

the prejob briefing, work tasks, associated hazards, engineering and administrative controls, required PPE, work control documents, and radiological and emergency conditions will be discussed.

Characterization specialists are responsible for identifying any potentially unsafe situations or conditions and reporting to the FTL/JSS and applicable ESH&QA representatives for corrective action. If it is perceived that an unsafe condition presents an imminent danger, characterization specialists are authorized to stop work immediately and notify the FTL/JSS of the unsafe condition.

#### **4.2.5 Waste Generator Services—Waste Technical Specialist**

The INEEL Waste Generator Services (WGS) waste technical specialist (WTS) will ensure disposition of waste material is in compliance with identified guidance. WGS personnel have the responsibility to help solve waste management issues at the task site. Personnel also prepare the appropriate documentation for waste disposal and make the proper notifications, as required.

#### **4.2.6 Sample and Analysis Management—Technical Representative**

The Sample and Analysis Management (SAM) office technical representative is responsible to help define the analytical project, generate the sampling and analysis plan table, and generate and issue sample labels. The SAM representative will determine which laboratory will provide analytical services based on established policies and contracts and will prepare the task order statement of work. The SAM representative will also track analytical progress and perform cursory review of the final data packages. The SAM representative will obtain independent validation of the data results as project requirements dictate.

#### **4.2.7 ESH&QA Support**

ESH&QA personnel are assigned to the job site to provide resources and expertise to resolve ESH&QA issues. Personnel assigned to provide ESH&QA support must be qualified to recognize and evaluate hazards, environmental concerns, or quality issues according to his or her expertise and will be given the authority to take or direct immediate actions to ensure compliance and protection. ESH&QA personnel assess and ensure compliance with applicable INEEL procedures including this document.

Radiological control support personnel are the source for information and guidance on radiological hazards at the task site. Radiological support personnel may include the radiological control supervisor, radiological control technicians (RCTs), and/or radiological engineers. The RCT is responsible to survey the task site, equipment, and samples and provide guidance for work activities in accordance with the applicable company manuals. The radiological engineer provides information and guidance relative to the evaluation and control of radioactive hazards at the task site, including performing radiation exposure estimates and as low as reasonably achievable (ALARA) evaluations, identifying the type(s) of radiological monitoring equipment necessary for the work, and advising personnel of changes in monitoring and PPE.

#### **4.2.8 Data Storage Administrator**

The data storage administrator is responsible for maintenance of data records. For this sampling plan, the records coordinator for WAG 3 will serve as the data storage administrator.



## 5. SAMPLING DATA QUALITY OBJECTIVES

The objective of this sampling activity is to obtain technically representative sampling and analysis data for soil and construction debris. These data will then be used for determining the options for dispositioning the materials and to support waste management and disposal. In order to support these objectives, existing data on type and concentration of contaminants for areas within the Scope of Work were reviewed and various options for reuse or disposal were identified. This information was then evaluated following the data quality objective (DQO) process (EPA 1994).

### 5.1 Problem Statement

The purpose of this DQO process is to support decision-making activities as they pertain to the field construction activities of the TFIA. The objective of DQO Step 1 is to use relevant information to clearly and concisely state the problem to be resolved.

There are two basic components to the problem: reuse and disposal. Reuse addresses soils, including sand/gravel, encountered in Phase I and II. Disposal addresses construction debris (concrete, asphalt, metal, wood, soils, vegetative debris, PPE, and pond lining materials). The problem statements (PSs) associated with this DQO process steps are as follows:

- PS 1—Reuse: Given soils will be disturbed during the Phase I and II field activities, collect data on the soils to determine if it will pose an unacceptable risk in comparison to the OU 3-13 RAOs.
- PS 2—Disposal: Given that construction debris will be generated in Phase I and II field activities, collect the required information to characterize the wastes so they can be properly managed and disposed in accordance with the WMP.

### 5.2 Decision Statements

The second step in the DQO process identifies the decisions and the potential actions that will be taken based on the data collected. This is done by forming principal study questions (PSQs) and alternative actions (AAs) that could result from resolution of the PSQs and by combining the PSQs and AAs into decision statements (DSs).

The objectives of this FSP are to answer the following questions:

- PSQ 1—Will soil generated in Phase I and II field activities present an unacceptable risk, as defined by exceeding a cumulative carcinogenic risk of  $1 \times 10^{-4}$  or a cumulative hazard index (HI) of 1 for noncarcinogenic contaminants for current and future users and the Snake River Plain Aquifer? Risk-based soil concentrations corresponding to a  $1 \times 10^{-4}$  risk or HI of 1 are presented in OU 3-13 ROD (DOE-ID 1999).
- PSQ 2—Do sufficient data exist to characterize construction debris?

Given the PSQs developed for the TFIA soils and construction debris, the associated DSs are as follows:

- DS 1—Determine if concentrations of contaminants of concern in soils exceed the remediation goals.

- DS 2—Collect representative samples of construction debris wastes and analyze using field or laboratory analytical instrumentation when insufficient data are available to make waste characterizations.

## 5.3 Decision Inputs

The third step in the DQO process is to identify the informational inputs required to resolve the DSs and to determine which of those inputs require measurements.

### 5.3.1 Information Required to Resolve Decision Statements

Table 5-1 specifies the information (data) required to resolve each of the DSs identified in Section 5.2 and identifies whether these data already exist. For the data that are identified as existing, the source references for the data have been provided with a quality assessment as to whether the data are of sufficient quality to resolve the corresponding DS. The qualitative assessment of the existing data was based on the evaluation of the corresponding quality control data (e.g., spikes, duplicates, and blanks), method detection limits, data collection methods, etc.

Table 5-1. Required information and reference sources.

DS #	Remediation Variable	Required Data	Does Data Exist?	Source Reference	Sufficient Quality?	Additional Information Required?
1	Radiological activity	Process data, field screening, and/or laboratory measurements of potential contaminants	Y	OU 3-13 ROD	N	Y <sup>a,b</sup>
1	Chemical concentrations	Process Data	Y	OU 3-13 ROD	Y	Y <sup>c</sup>
2	Radiological activity	Process data, field screening, and/or laboratory measurements of potential contaminants	Y	OU 3-13 ROD	N	Y <sup>a,b</sup>
2	Chemical concentrations	Process Data	Y	OU 3-13 ROD	Y	Y <sup>c</sup>

a. Field screening by RCT and gamma spectrometry.

b. Analytical laboratory analyses as needed.

c. As needed for HWDs.

### 5.3.2 Computational and Survey/Analytical Methods

Table 5-2 identifies the DSs where data do not exist or insufficient to resolve the DSs. Field-based surveying or sampling methods that could be used to obtain the required data are presented in Table 5-3. For **DS 1**, process knowledge and field-based gamma spectrometry data will be used to determine the type and concentration range of potential contaminants. For **DS 2**, analytical data will be collected to determine the average concentration of contaminants when insufficient data are available to make waste characterizations. These data will be used for the purposes of excess risk analysis and waste characterization for DSs 1 and 2, respectively.

Table 5-2. Information required to resolve the decision statements.

DS #	Remediation Variable	Required Data	Computational Methods	Survey/Analytical Methods
1	Radiochemical	Contamination levels of excavated soils	Compare maximum to remediation goals	Radiological survey instrumentation or analytical laboratory determination of radionuclides
2	Radiochemical	Contamination levels of construction debris and soils exceeding remediation goals	Compare mean to disposal facility waste limits	Radiological survey instrumentation or analytical laboratory determination of radionuclides

### 5.3.3 Analytical Performance Requirements

Table 5-3 defines the analytical performance requirements for the data that need to be collected to resolve the DSs. These performance requirements include the practical quantitation limit, precision, and accuracy requirements for each of the contaminants.

Table 5-3. Analytical performance requirements.

Analyte List	Survey/Analytical Method	Preliminary Action Level	Practical Quantitation Limit (PQL)	Precision Requirement	Accuracy Requirement
<b>Decision Statement #1</b>					
Gamma emitters	Field-based gamma spectrometry	OU 3-13 RAOs	0.1 pCi/g	± 20%	80-120
<b>Decision Statement #2</b>					
Gamma emitters	Field-based gamma spectrometry	Refer to disposal site WAC	See Quality Assurance Project Plan	± 20%	80-120

## 5.4 Study Boundaries

The fourth step in the DQO process is to determine the spatial and temporal boundaries of the study. The spatial boundaries define the physical extent of the study area; they may be subdivided into specific areas of interest. The temporal boundaries define the duration of the entire study or specific parts of the study. The appropriate outputs of this step are a detailed description of the spatial and temporal boundaries of the problem and a discussion of any practical constraints that may interfere with the study.

The spatial boundaries of the interim remediation areas are described in Remedial Design/ Remedial Action (RD/RA) Work Plan (WP) (DOE-ID 2003e). As described in the RD/RA WP, the horizontal extent of the remedial activities will be the tank farm and the system of drainage ditches connecting to the evaporation pond. The vertical extent of the remedial activities will be (a) regrading existing drainage ditches, (b) removing a few inches of the soil cover above the release sites in the tank farm for the asphalt cover, and (c) excavating several feet for installation of ditch headwall and endwalls and duct banks at certain locations.

The temporal boundaries of the interim remediation were established to meet the milestones set by the Agreement between the IDEQ, EPA, and DOE (Bowhan 2003), requiring Phase I work to be completed by September 30, 2003, and Phase II work to be completed by September 30, 2004. Further details about the construction schedule can be found in Appendix H of the RD/RA WP (DOE-ID 2003e).

## 5.5 Decision Rule

The fifth step in the DQO process is to (1) define the parameters of interest that characterize the population, (2) specify the action level, and (3) integrate previous DQO outputs into a single statement that defines the conditions that would cause the decision-maker to choose among AAs. The decision rule typically takes the form of one or more “If...then” statements describing the action or actions to take if one or more conditions are met. The decision rule must be specified in relation to a parameter that characterizes the population of interest. The decision rules for the project appear in Table 5-4.

Table 5-4. Decision rules

DS#	DR#	Decision Rule
1	1	<i>If</i> excavated soils from Phase I and II are excess and do not meet the OU 3-13 RAOs or the soil is from a CERCLA no-further action site, <i>then</i> the soil must be removed and managed in accordance with this WMP. The criteria for meeting the RAOs are defined by achieving a cumulative carcinogenic risk of $1 \times 10^{-4}$ or a cumulative HI of 1 for noncarcinogenic contaminants to current and future users.
1	2	<i>If</i> the excess soils from Phase I and II do meet the RAOs, <i>then</i> the soil may be reused.
2	3	Available data, field-based gamma screening, and analytical laboratory data, as needed, will be used for disposing the wastes in accordance with the WMP.

## 5.6 Decision Error Limits

The sixth step in the DQO process is to minimize uncertainty in the data by specifying tolerable limits in the design errors. Since analytical data can only estimate the true condition of the site under investigation, decisions based on measurement data could potentially be in error (i.e., decision error). For this reason, the primary objective of this step is to determine which DSs, if any, require a statistically based sample design. Determining the decision error limits specifies the decision-maker's tolerable limits on decision errors, which are used to establish performance goals for the data collection design.

Two types of decision errors can occur for characterization of soils and debris contained in the TFIA site:

- Determining that the contaminated soil possesses an acceptable risk when, in fact, this is not true, or
- Determining from the characterization of the waste that no contaminants are present above a disposal facility's WAC levels when, in fact, they are above that level.

Though the consequences for each decision error must be considered, the first decision error offers the more severe consequence, as the error could result in human health and/or ecological impacts. To protect against the above errors, quantitative field-based gamma spectrometry of the regulated constituents will be performed on the wastes as needed. As DSs 1 and 2 are not based on a statistical sampling design, the decision error limits are based on professional judgment. Therefore, statistical error limits are not used in the determination of sampling locations or frequency.

## **6. DESIGN BASIS**

The basis for the design is to determine whether contaminant levels in soils and construction debris exceed the threshold of acceptable risk as identified in the OU 3-13 ROD (DOE-ID 1999). To make this determination, an estimate of the mean concentration, or maximum concentration, of the contaminants of tank farm soils and construction debris will be determined. The design approach is to use random sampling combined with field-based gamma spectrometry and process knowledge for characterizing the soil and construction debris from the remedial action activities.

The interim remedial action as detailed in the RD/RA WP (DOE-ID 2003e) is to install an impermeable barrier over waste sites CPP-28, CPP-31, and CPP-79 and construct a conveyance system to route storm water from these sites to an evaporation pond. To install the impermeable barrier inside the tank farm, soil will need to be removed to accommodate the asphalt cover and meet the tank load limitations. Outside the tank farm, the work will consist of regrading and excavating soils to construct drainage ditches and install duct banks.

The purpose of the OU 3-13 TFIA is to address surface water infiltration from the contaminated tank farm soil. This is only an interim remedial action. A final remedy will be developed following additional site characterization, risk analysis, and feasibility studies, which will be presented in the OU 3-14 ROD (DOE-ID 1999). As an interim action, this WMP is intended to only address soil and construction debris generated through the construction of the systems installed by the TFIA. This plan will not be used for determining the nature and extent of contamination for any areas. The approach is based on a set of performance standards as well as technical factors, which are discussed in the following sections.

### **6.1 Technical Factors of Importance in Design**

The design of the TFIA remedial action has been developed in the RD/RA WP for Group 1, TFIA (DOE-ID 2003e). The factors applicable to the design of the remedy are detailed in that document.

For the activities outlined in this WMP, certain factors are considered important to incorporate into the design of the sampling activities in order to obtain information necessary for implementing the remedy. These factors include, but are not limited to, (1) limiting characterization of materials to the Scope of Work in the RD/RA WP (DOE-ID 2003e), (2) collection of representative samples for contaminant analysis, as needed, (3) producing scientifically defensible analytical data, and (4) minimization of worker exposure during remedial action activities.

### **6.2 Characterization Approach**

The approach for characterizing the materials to be generated from the remedial actions will be to apply process knowledge and to use random sampling in combination with field-based gamma spectrometry. The types of materials to be generated by the remedial action activities consist of soil (as defined by 40 CFR 268.2) and construction debris. Construction debris may contain soil intermixed. Characterization of the materials will be conducted to facilitate material disposition (i.e., reuse or disposal). Excess soil that does not exceed the OU 3-13 remediation action objectives can be reused within the AOC; otherwise the soil will be appropriately managed in accordance with this plan. Debris will be considered waste and will be appropriately characterized and disposed. The approach will be to separately characterize the soil and debris. The approaches for characterizing these materials are described in the following sections. Definitions of the activities to be conducted in the two phases of the remedial action are provided in Section 1.

### 6.2.1 Excess Soil

Excess soil that exceeds the OU 3-13 remediation goals will either be reused or will be managed in accordance with the WMP. The OU 3-13 ROD identifies nine contaminants of concern; one of the contaminants is a metal (mercury) and eight are radionuclides (see Section 4.1). Tank farm soils contaminated from past releases of these contaminants were covered with a liner and soil. The anticipated excess soil will come from this cover soil and are not expected to be contaminated with these contaminants. Similarly, there are no known materials on the surface anticipated to be encountered containing listed wastes. The type and amounts of metals and listed wastes, if any, in the soil will be determined by using existing process knowledge unless radiological screening, discussed below, shows the soil exceeds the RAOs. For soil that exceeds the RAOs, samples will be collected according to the protocol in Table 6-1 and for tested for the analytes in Table 6.2.

The soil may contain radiological contamination from airborne releases and will be characterized by an initial radiological survey from an RCT followed by using field-based gamma spectrometry. If the gamma spectrometry results show the soil meets the OU 3-13 soil risk-based RAOs, the soil can be reused in accordance with Section 10. If the radiological screening shows that the soil fails to meet the RAOs, the soil must be characterized and appropriately managed and disposed of in accordance with Section 10. Samples collected from the tank farm for the field-based radiological spectrometry will be collected in a random manner following the protocol in identified in Table 6-1. Characterization of soil outside the tank farm will also be conducted using field-based gamma spectrometry with the exception that the gamma spectrometer will be set-up over the soil in place for an in situ measurement. If results of field tests reveal high radiological activities over a large area, indicating a larger airborne release or spill, an additional set of samples will be collected and submitted to the Radiological Measurements Laboratory for speciation. Sample collection will follow the protocol in Table 6-1. The samples will be analyzed for the contaminants listed in Table 6-2 by the methods listed in Table 6-3.

Table 6-1. Protocol for soils sampling inside the tank farm

Release Site	Number of Samples	Type of Sample	Sample Volume (grams)	Sample Location
CPP-31	6	Grab	150"	Surface (i.e., <4 in.)
CPP-28 and CPP-79	3	Grab	150"	Surface (i.e., <4 in.)
a. As needed for test				

Table 6-2. Data quality summary table for the soil and debris wastes.

Constituents	Measurement of Concern	Analytical Data Category	Data Use
Radiological analysis	Gamma spectroscopy Cs-137; Eu-152, -154  Alpha isotopic Pu-238, -239, -240, Am-241  Beta isotopic Sr-90, Pu-241	Definitive	Characterization, management of materials, and disposal options
Metals	UTS	Definitive	Characterization, management of materials, and disposal options
Polychlorinated biphenyls (PCBs)	Arochlor	Definitive	Characterization, management of materials, and disposal options
Organics	Appendix IX total analyte list (TAL) volatile organic compounds (VOCs)  Appendix IX TAL semivolatile organic compounds (SVOCs)	Definitive	Characterization, management of materials, and disposal options

Table 6-3. Analytical methods for contaminants.

Constituent	Analytical Method	Solids Detection Limits
Strontium-90	Gas Flow Proportional	0.5 pCi/g
Plutonium isotopes	Advanced Light Source	0.05 pCi/g
Plutonium-241	Liquid Scintillation Counting	1 pCi/g
Americium-241	Advanced Light Source	0.05 pCi/g
Gamma emitters	Geological Survey	–0.1 pCi/g
UTS metals	EPA Methods 1311, 3010A, 7760A, 6010B, and 7470A	0.2-1000 mg/kg depending on metal
PCBs	EPA Method 8082	350 ug/kg
Appendix IX TAL VOCs (including acetone, methylene chloride, 1,1,1-trichloroethane, tetrachloroethene, and trichloroethylene)	EPA Method 8260B	5- 100 ug/kg depending on VOC (must meet UTS detection limits for those analytes in parentheses)
Appendix IX TAL SVOCs	EPA Method 8270C	660-3300 ug/kg depending on SVOC

### **6.2.2 Construction Debris**

Construction debris will be disposed of at either the INEEL Industrial Waste Landfill or the ICDF. Field radiological screening and process knowledge will be used for determining the correct disposal path. Each source of construction debris will need to be characterized separately. Debris will be initially scanned by a RCT followed by field-based gamma spectrometry. Hazardous constituents will be characterized using process knowledge, followed by sampling if the waste is identified as having potential listed or characteristic waste codes.

Field-based gamma spectrometry testing of debris will be conducted either in situ (i.e., setting up the gamma spectrometer over the waste) or by collecting a grab sample of each source followed by testing with the gamma spectrometer. If results of field tests reveal high radiological activities (i.e.,  $>23$  pCi/g Cs-137), an additional set of samples will be collected and submitted to the Radiological Measurements Laboratory for speciation. Additionally, a grab sample will be collected for analysis of the RCRA constituents and polychlorinated biphenyls. The samples will be analyzed for the contaminants appearing in Table 6-2 and by the methods listed in Table 6-3. Sample volumes, container sizes, and analytical requirements for the analytes are detailed in Table 9-1.

### **6.2.3 Sample Analytical Requirements**

Should laboratory analysis of contaminants become necessary, the information presented in Tables 6-2 and 6-3 is provided to identify the data quality categories and analytical methods, and Table 9-1 presents the sample bottles, preservation types, and holding times. For more details concerning this information, see the SAM representative.

## 7. SAMPLE DESIGNATION

If analytical laboratory data is needed, samples will be collected and identified with a unique code and arranged in a Sample and Analysis Plan (SAP) table and database. Appendix A contains a SAP table for this project.

### 7.1 Sample Identification Code

A systematic character identification (ID) code will be used to uniquely identify all samples. Uniqueness is required to maintain consistency and prevent the same ID code from being assigned to more than one sample.

The first designator of the code, 1, refers to the sample originating from WAG 3. The second and third designators, RA, refer to the sample being collected in support of the remedial action. The next three numbers designate the sequential sample number for the project. Regular and field duplicate samples will be designated with a two-character set (e.g., 01, 02). The last two characters refer to a particular analysis.

For example, a soil sample collected in support of the remedial action might be designated as 1RA00101R4, where in the following (from left to right):

- **1** designates the sample as originating from WAG 3
- **RA** designates the sample as being collected for the remedial action
- **001** designates the sequential sample number
- **01** designates the type of sample (01 = regular, 02 = field duplicate)
- **R4** designates gamma spectrometric analysis.

The Integrated Environmental Data Management System database will be used to record all pertinent information associated with each sample identification code. Preparation of the plan database and completion of the SAM request for services are used to initiate the sample and sample waste tracking activities performed by the SAM.

### 7.2 Sample and Analysis Plan Table/Database

The following sections describe the information recorded in the SAP table provided in Appendix A.

#### 7.2.1 Sample Description Fields

The sample description fields contain information relating individual sample characteristics.

**7.2.1.1 Sampling Activity.** The sampling activity field contains the first six characters of the assigned sample number. The sample number in its entirety will be used to link information from other sources (field data, analytical data, etc.) to the information in the SAP tables for data reporting, sample tracking, and completeness reporting. The analytical laboratory will also use the sample number to track and report analytical results.

**7.2.1.2 Sample Type.** Data in this field will be selected from the following:

REG for a regular sample

QC for a QC sample.

**7.2.1.3 Matrix.** Data in this field will be selected from the following:

Soil for soil samples

Debris for debris samples

Water for quality assurance/quality control (QA/QC) samples.

**7.2.1.4 Collection Type.** Data in this field will be selected from the following:

GRAB for grab

COMP for composite

FBLK for field blanks

RNST for rinsates

DUP for duplicate samples.

**7.2.1.5 Planned Date.** This date is related to the planned sample collection start date.

## **7.2.2 Sample Location Fields**

This group of fields pinpoints the exact location for the sample in three-dimensional space, starting with the general “Area,” narrowing the focus to an exact location geographically, and then specifying the “Depth” in the depth field.

**7.2.2.1 Area.** The “Area” field identifies the general sample-collection area. The field should contain the standard identifier from the INEEL area being sampled.

**7.2.2.2 Location.** The “Location” field may contain geographical coordinates, x-y coordinates, building numbers, or other location-identifying details, as well as program-specific information, such as a borehole or well number. Data in this field will normally be subordinated to the “Area.” This information is included on the labels generated by the SAM to aid sampling personnel.

**7.2.2.3 Type of Location.** The “Type of Location” field supplies descriptive information concerning the exact sample location. Information in this field may overlap that in the location field but it is intended to add detail to the location (e.g., native soil, vault wall, pit floor, tank cradle).

**7.2.2.4 Depth.** The “Depth” of a sample location is the distance in feet from surface level or a range in feet from the surface.

### **7.2.3 Analysis Type**

The “Analysis Type” (i.e., “Analysis Type” 1 through 20) fields indicate analytical types (radiological, chemical, hydrological, etc.). Space necessary to clearly identify each type is provided at the bottom of the form. A standard abbreviation should also be provided, if possible.



## **8. SAMPLING PRACTICES**

ALARA principles will be evaluated to determine if their use will be necessary based on the levels of contamination anticipated to be encountered. Work controls will be developed and will undergo approvals. Once the appropriate administrative controls are in place, PPE and other equipment would be brought to the site. If control zones are needed, they will be roped off and marked in accordance with the Health and Safety Plan (HASP) (INEEL 2003).

### **8.1 Sample Location Surveys**

Samples taken from location of the remedial actions shall be recorded as to the source of the sample through surveying sample location points to establish horizontal (northing and easting coordinates) and vertical (elevation referenced to mean sea level) control.

Horizontal (H) and vertical (V) control will be consistent with standard third-order accuracy, where

$H = 1/5,000$  or 5 seconds of arc

$V = 0.05$  feet per M (length of loop in miles).

### **8.2 Sample Screening**

Prior to releasing samples collected from radioactively contaminated areas, the RCT will survey the external surfaces of all such samples for contamination and perform a radiation survey to determine whether the sample container meets the release criteria for unrestricted use. Samples will also need to be characterized to determine the concentration of radionuclides present and the hazardous material classification for shipping purposes. This determination is usually made by the Radiological Control organization. All samples will be shipped to the laboratories by a company-certified hazardous materials shipper in accordance with DOT regulations and current INEEL policy.

### **8.3 Field Decontamination**

Field decontamination procedures are designed to prevent cross-contamination between locations and samples and prevent off-Site contaminant migration. All equipment associated with sampling will be thoroughly decontaminated prior to daily activities and between sample locations. Following decontamination, sampling equipment will be wrapped in foil to prevent contamination from windblown dust.

### **8.4 Handling and Disposition of Sampling Waste**

Waste streams generated as a result of the sampling may include (but not be limited to) PPE, sample supplies and equipment, decontamination water (which may be used in small quantities during sampling), sample preparation materials, and excess or spent samples. All waste streams that are generated as a result of the sampling activities will be managed in accordance with Section 10.

## **8.5 Waste Minimization and Segregation**

Waste minimization for the project will be primarily achieved through design and planning to ensure efficient operations that minimize unnecessary waste generation. As part of the prejob briefing, an emphasis will be placed on waste reduction philosophies and techniques, and personnel will be encouraged to continuously attempt to improve methods. No one will use, consume, spend, or expend equipment or materials thoughtlessly or carelessly. Practices to be instituted to support waste minimization include, but are not limited to, the following:

- Restricting material (especially hazardous material) entering radiological buffer areas to those needed for performance of work
- Substituting recyclable items for disposable items
- Reusing items when practical
- Segregating contaminated waste from uncontaminated waste
- Segregating reusable items such as PPE and tools.

## **9. DOCUMENTATION MANAGEMENT AND SAMPLE CONTROL**

Section 9.1 summarizes document management and sample control. Documentation includes field logbooks used to record field data and sampling procedures, photographic documentation, chain-of-custody forms, and sample container labels. Section 9.2 outlines the sample handling and discusses chain-of-custody, radioactivity screening, and sample packaging for shipment to the analytical laboratories.

### **9.1 Documentation**

The FTL will be responsible for controlling and maintaining all field documents and records and for ensuring that all required documents will be submitted to the Administrative Records and Document Control Office at the conclusion of the project.

Sample documentation, shipping, and custody procedures for this project are based on EPA-recommended procedures that emphasize careful documentation of sample collection and sample transfer. The appropriate information pertaining to each sample will be recorded in a logbook on a chain-of-custody form. All personnel involved with handling, managing, or disposing of samples will follow INEEL policies and procedures.

A document action request is required when field conditions dictate making any change to this WMP, the project HASP, or project procedures (e.g., requiring additional analyses to meet appropriate WAC).

All information recorded on project documentation will be made in permanent ink. All errors will be corrected by drawing a single line through the error and entering the correct information; all corrections will be initialed and dated. In addition, photographs will be taken to document the field sampling activities.

#### **9.1.1 Sample Container Labels**

Waterproof, gummed labels generated by the SAM technical representative will display information such as the sample ID number, the name of the project, sample location, depth, and requested analysis type. In the field, label information will be completed and placed on the containers before samples are collected. Sample date, time, preservative used, field measurements of hazards, and the sampler's initials will be recorded during field sampling.

#### **9.1.2 Field Guidance Forms**

Field guidance forms, provided for each sample location, will be generated by the SAM Integrated Environmental Data Management System database to ensure unique sample numbers. Used to facilitate sample container documentation and organization of field activities, these forms contain information regarding the Field Guidance Forms, which include the following:

- Media/matrix
- Analysis description
- TOS line item code number
- Sample identification numbers

- Sample location
- Aliquot identification
- Analysis type
- Container type and size
- Minimum sample quantity
- Hold time
- Sample preservation methods
- Laboratory point of contact, address, and phone number
- Field logbooks.

In accordance with the Administrative Records and Document Control format, field logbooks will be used to record information necessary to interpret the analytical data. The FTL, or designee, will ensure by periodic inspection that the field logbooks are being maintained in accordance with the current accepted practices. The field logbooks will be submitted to the project files at the completion of field activities.

### **9.1.3 Sample Logbooks**

Sample logbooks used by the field teams will contain such information as the following:

- Physical measurements (if applicable)
- All QA/QC samples
- Shipping information (e.g., collection dates, shipping dates, cooler ID number, destination, chain-of-custody number, and name of shipper)
- Location of samples
- Media sampled
- Volume of media sampled
- Names of individuals performing the sampling.

### **9.1.4 Field Team Leader's Daily Logbook**

A project logbook maintained by the FTL will contain a daily summary of the following:

- All team activities
- Problems encountered

- Visitors
- List of work site contacts.

This logbook will be signed and dated by the FTL or designee at the end of each day's sampling activities.

## **9.2 Sample Equipment and Handling**

Analytical samples for laboratory analyses will be collected in precleaned bottles and packaged according to American Society for Testing and Materials or EPA-recommended procedures. The Quality Assurance Project Plan (QAPjP) samples will be included to satisfy the QA/QC requirements for the field operation as outlined in the QAPjP (DOE-ID 2002). Qualified (SAM-approved) analytical and testing laboratories will analyze these samples.

### **9.2.1 Sample Equipment**

Included below is a tentative list of necessary equipment and supplies. This list is as extensive as possible, but not exhaustive, and should only be used as a guide. Other equipment and supplies specified in the project-specific HASP are not included in this section. Field sampling and decontamination supplies may include the following:

- Stainless-steel hand augers
- Hammer
- Stainless steel chisel
- Hacksaw
- Tape measure (30.5 m [100 ft])
- Stainless steel spoons
- Paper wipes
- Plastic garbage bags
- De-ionized water (20 L [5.3 gal] minimum)
- Nonphosphate-based soap
- Isopropanol
- Spray bottles
- Aluminum foil
- Certified ultrapure water (5 L [1.3 gal] JT Baker)
- Sample and shipping logbook
- FTL logbook

- Controlled copies of the QAPjP, HASP, and applicable referenced procedures
- Ink pens
- Black ultrafine markers
- Sample containers
- Preprinted sample labels and field guidance forms
- Nitrile or latex gloves
- Leather work gloves
- Ziploc plastic bags
- Custody seals.

Sample preparation and shipping supplies include the following:

- Paper wipes
- Clear tape
- Strapping tape
- Resealable plastic bags (such as Ziploc), in various sizes
- Chain-of-custody forms
- Shipping request forms
- Names, addresses, telephone numbers, and contact names for analytical laboratories
- Task order statements of work for analytical laboratories and associated purchase order numbers
- Vermiculite or bubble-wrap (packaging material)
- Plastic garbage bags
- Blue Ice
- Coolers
- “This Side Up” and “Fragile” labels
- Address labels
- Sample bottles and lids
- Custody seals.

### 9.2.2 Sample Containers

Table 9-1 identifies container volumes, types, holding times, and preservative requirements that apply to all samples collected under this WMP. All containers will be precleaned (typically certified by the manufacturer) using the appropriate EPA-recommended cleaning protocols for the bottle type and sample analyses. Extra containers will be available in case of breakage, contamination, or if the need for additional samples arises. Prior to use, preprinted labels with the name of the project, sample identification number, location, depth, and requested analysis will be affixed to the sample containers.

### 9.2.3 Sample Preservation

Samples will be preserved in a manner consistent with the QAPjP (DOE-ID 2002). If cooling is required for preservation, the temperature will be checked periodically before shipment to certify adequate preservation for those samples that require temperatures of 4°C (39°F) for preservation. Ice chests (coolers) containing frozen reusable ice will be used to chill samples in the field after sample collection, if required.

### 9.2.4 Chain of Custody

Custody seals will be placed on all shipping containers to ensure that tampering or unauthorized opening will not compromise sample integrity. The seal will be attached in such a way that opening the container requires the seal to be broken. Clear plastic tape will be placed over the seals to ensure that the seals are not damaged during shipment. Seals will be affixed to containers before the samples leave the custody of the sampling personnel.

Sample bottles will be stored in a secured area accessible only to the field team members

Table 9-1. Sampling bottles, preservation types, and holding times.

Analysis	Volume	Container Type	Preservative	Holding Time
Alpha radionuclides	10 g	High-density polyethylene (HDPE)	NA <sup>a</sup>	180 days for all isotopes
Beta radionuclides	6 g	HDPE	NA	180 days for all isotopes
Gamma emitters	500 g	HDPE	NA	180 days for all isotopes
UTS metals	235 g	Glass or plastic	4°C	180 days for all metals except mercury which is 28 days
Polychlorinated biphenyls (PCBs)	90 g	250 ml WM, G	4°C	14 days
Appendix IX TAL VOCs (including acetone, methylene chloride, 1,1,1-trichloroethane, tetrachloroethene, and trichloroethylene)	60 g	Glass	4°C	14 days
Appendix IX TAL SVOCs	90 g	Glass	4°C	14 days

a. NA = not applicable.

### **9.2.5 Transportation of Samples (On-Site and Off-Site)**

An on-Site shipment is any transfer of material within the perimeter of the INEEL. Site-specific requirements for transporting samples within Site boundaries and those required by the shipping/receiving department will be followed. Shipments within the INEEL boundaries will conform to DOT requirements. Off-Site sample shipments will be coordinated with INEEL Packaging and Transportation personnel, as necessary, and will conform to all applicable DOT and EPA sample handling, packaging, and shipping methods.

## **10. WASTE MANAGEMENT REQUIREMENTS**

This section describes the general requirements for waste management.

### **10.1 Remediation Waste**

Wastes resulting from the TFIA that may require disposal include PPE, soil, asphalt, concrete, rip-rap, metal culvert, and decontamination wastes. These wastes will be disposed of in accordance with the final ROD for OU 3-13 (DOE-ID 1999) and this WMP.

### **10.2 Waste Minimization and Segregation**

Waste minimization for this project will be accomplished through design and planning to ensure efficient operations that will not generate unnecessary waste. As part of the prejob briefing, emphasis will be placed on waste reduction philosophies and techniques. Personnel will be encouraged to continuously attempt to improve methods for minimizing waste generation. Practices to be instituted to support waste minimization include, but are not limited to, the following:

- Restricting material (especially hazardous material) entering controlled areas to those needed for work performance
- Substituting recyclable items for nonhazardous and easily disposed of items
- Reusing items when practical
- Segregating contaminated waste from uncontaminated waste
- Segregating reusable items such as PPE and tools.

### **10.3 Waste Management and Disposition**

Wastes generated from the TFIA remedial activities will be managed and dispositioned in accordance with this WMP. The planned management and disposition of the waste streams described in this WMP are based on information from the Remedial Investigation/Feasibility Study (DOE-ID 1997), the ROD (DOE-ID 1999), the RD/RA WP (DOE-ID 2003e), and other available data. Wastes from the interim action activities that exceed the stated RAOs as specified in the ROD will be managed as CERCLA remediation-derived wastes. Prior to disposal of these wastes at the ICDF, these wastes may be temporarily managed within the area generated (e.g., tank farm) under the substantive requirements of Idaho Administrative Procedures Act 16.01.05.008(40 CFR 264.553, "Temporary Units," and 40 CFR 264.554, "Staging Piles"). By managing the wastes in this manner, placement, as specified by RCRA, will not be triggered. If this temporary management is needed when the waste is removed from where it was generated, the staging shall occur either at the Staging and Storage Annex (SSA) or the ICDF in accordance with the respective facility's controlling document for management of CERCLA remediation waste. The final disposition of these wastes will be in the ICDF, if the wastes meet the ICDF WAC.

As discussed in Section 3, the anticipated wastes include soil, debris, PPE, and decontamination wastes. Table 3-1 summarized the management and disposition options for all waste streams. Details of the management and disposition of the anticipated waste streams are provided in the following sections.

### 10.3.1 Soils

The TFIA remedial activities will include drainage system improvements inside and outside of the INTEC fence. Soils that are disturbed will be assessed to determine if they meet the OU 3-13 RAOs, using field-base gamma spectrometry. Soils that meet the RAOs will be reused as fill material within the AOC, which may include redistributing tank farm soils within the tank farm. Soils that exceed the RAOs will be managed as CERCLA waste and characterized so that HWDs can be made to meet the ICDF requirements. This waste may be temporarily managed as detailed in Section 4.2.2. Disposal shall be at the ICDF in accordance with the ICDF's requirements.

### 10.3.2 Industrial Waste

This waste stream may consist of soil and debris with trace levels of contamination. IW is solid waste that is neither radioactive nor hazardous. IW streams at the INEEL are typically disposed at the INEEL Landfill Complex, provided the INEEL WAC is met which includes no free liquids and clear packaging. Landfill acceptance criteria are defined in the INEEL WAC (DOE-ID 2003a). Many CERCLA IWs are typically generated in the AOC as a result of material used in a remediation project that the generator believes has not become contaminated with either radioactive or hazardous materials. This lack of contamination is validated through the use of radiation surveys or visual inspections. A general HWD is prepared for routinely generated IW to document that the waste is neither radioactive nor HW.

IW waste streams that have a higher probability of containing constituents restricted from disposal are considered nonroutine and will undergo a waste-stream-specific HWD. This is accomplished by sampling, performing radioactive surveys, using process knowledge of the IW waste generating process (e.g., was the waste mixed with a listed waste or derived from the treatment, storage, or disposal of a listed waste?), and evaluating the composition of the IW.

WGS evaluates CERCLA IW to determine if the waste meets the IW acceptance criteria. IW is generally collected in IW collection dumpsters. Signs on the collection dumpsters describe acceptable and prohibited items. Other methods utilized at the INEEL Landfill Complex to ensure disposal of IW is protective to human health and the environment are

- Characterization of IW by WGS to ensure the requirements of the WAC are met prior to shipment to the facility
- Prohibiting the receipt of radioactive and HW
- Prohibiting the receipt of free liquids at the landfill
- Periodic waste inspections of received waste to validate that the waste meets the acceptance and waste determination criteria
- Groundwater monitoring wells are located and sampled periodically in the vicinity of the INEEL Landfill Complex.

Environmental monitoring data have not indicated an environmentally significant release of hazardous substances has occurred to the air or groundwater from current IW disposal operations at the INEEL Landfill Complex. The current disposal area at the INEEL Landfill Complex is a solid waste management unit. As such, if any future environmentally significant releases to the air or groundwater are identified, the release may be subject to potential response action, as stipulated by Section V of the FFA/CO (DOE-ID 1991).

### **10.3.3 Low-Level Waste**

LLW, defined in Table 3-1, is not expected to be generated during the TFIA. Screening with a portable gamma spectrometer unit will occur for materials excavated under this project. If remediation goals are exceeded, these wastes may be temporarily managed within the area generated (e.g., tank farm) under the substantive requirements of IDAPA 58.01.05.008 (40 CFR 264.553, “Temporary Units,” and 40 CFR 264.554, “Staging Piles”). By managing the wastes in the area generated, placement, as specified by RCRA, will not be triggered. If this temporary management is needed when the waste is removed from the work zone, the staging shall occur either at the SSA or the ICDF in accordance with the respective facility’s controlling document for management of CERCLA remediation waste. LLW will be disposed of at the ICDF.

### **10.3.4 Hazardous Waste**

Historical releases inside the tank farm contained radiological contaminants and RCRA metals and listed wastes. Therefore, if HW is encountered, it is anticipated to be MLLW (i.e., containing both RCRA and radiological contaminants). Management and disposal of this waste would be as described for MLLW.

### **10.3.5 Mixed Low-Level Waste**

Because this project involves soil disturbance at INTEC, there is a possibility of generating MLLW, as defined in Table 3-1. RCTs will monitor activities. Working in radiologically contaminated soil will generate contaminated PPE (for example, gloves, boots, shoe covers, coveralls) and possibly contaminated equipment. Contaminated equipment will go through decontamination procedures, as warranted and necessary. If contaminated decontamination fluids are generated they will be solidified and managed in accordance with this WMP for disposal in the ICDF. Equipment that cannot be decontaminated will be containerized, as appropriate, and staged in the SSA for later disposal in the ICDF. Contaminated equipment may also be stored in a Radioactive Materials Storage Area for use elsewhere in contaminated areas. If it is determined that the area was contaminated from a release of RCRA-type waste, the primary and decontamination waste will be classified as MLLW. Decontamination liquids will be placed in drums and solidified. Contaminated monitoring wastes will be placed in this waste stream. Soil, asphalt, concrete, and metal culvert may be staged in waste piles in accordance with the management requirements detailed in Section 10.3. Waste piles containing materials exceeding the remediation goals and containing RCRA constituents will be disposed of in the ICDF.

### **10.3.6 New Waste Streams**

Any new waste streams encountered during the TFIA must be identified and characterized. New waste streams identified will be considered CERCLA remediation wastes unless discovered or proven otherwise. Any new waste streams will be evaluated to determine if the waste stream is from a new or previously identified CERCLA site or another source. At the time of generation, a HWD will be completed, documented, and approved. Management of the waste will be as appropriate and based on a HWD and this WMP.



## **11. MANAGEMENT AND DISPOSITION OF WASTE**

Waste resulting from the TFIA remediation will be stored and disposed of, as applicable, in accordance with the final ROD for OU 3-13 (DOE-ID 1999), this WMP, INEEL WAC (DOE-ID 2003a), the ICDF Complex Operations WMP (DOE-ID 2003f), applicable WAC, and appropriate regulations.

### **11.1 Packaging**

Packaging of all waste materials generated will be in compliance with the applicable disposal facility WAC; the DOT regulations (49 CFR 171, 49 CFR 173, 49 CFR 177, and 49 CFR 178), and RCRA regulations found in 40 CFR 264 Subpart I WGS and Packaging and Transportation personnel will be consulted prior to generation of any waste to identify specific types of containers to be used for the anticipated wastes.

### **11.2 Labeling**

WGS and Packaging Transportation personnel will be contacted to ensure waste containers are properly labeled. Waste containers in staging will be labeled and marked in accordance with the applicable receiving facility's requirements. Specifically, waste destined for the ICDF shall be labeled in accordance with the labeling requirements identified in that facility's WMP. IW destined for the INEEL Landfill Complex shall meet the INEEL WAC and be labeled in accordance with the applicable requirements specified in that facility's WAC. CERCLA waste destined for an off-Site facility shall, at a minimum, have an Integrated Waste Tracking System (IWTS) label, radiation label (if applicable), and a CERCLA waste label to ensure that personnel know the contents within the container. The CERCLA waste label shall identify the project that generated the waste (e.g., OU 3-13, Group 1); the date the waste was placed in storage or staging; the waste description (solid, liquid, soil, debris, PPE, etc.); and the waste hazards (e.g., radioactive, asbestos-contaminated, RCRA waste codes). Prior to off-Site transport, additional labeling may be required, including DOT-required labeling.

Any information not known when waste containers are initially labeled may be added when the information is known. WGS personnel will provide IWTS bar codes for containers, as applicable. A new bar code will be affixed to each container when waste is first placed in the container. Waste labels must be visible, legibly printed or stenciled, and placed on the container in a manner so that a full set of labels and markings is visible during an inspection.

### **11.3 Storage and Inspection**

Remediation waste staging piles may be used to manage waste soil piles or containers of CERCLA hazardous or mixed waste. (Figure 11-1 depicts a cross section of a typical staging pile.) Staging piles may be used for a period of up to 24 months unless an extension is provided by the Agencies. If waste is staged prior to treatment and disposal, the waste will be staged in proximity to the remediation site. The staging and inspection of all waste generated from this activity will be performed in accordance with the applicable requirements for waste staging piles found in 40 CFR 264.554 and this WMP.

If staging piles will be used for staging of solid, nonflowing, noncontainerized remediation wastes, the wastes will be placed on impervious liners. Construction of the base will ensure there is at least a 2% slope away from the soil waste pile to ensure proper drainage. The bottom liner material for the soil will be of sufficient strength/design to withstand the planned staging and subsequent removal of soils. The bottom liner will extend at least 5 ft beyond every edge of the waste soil pile. The use of an impervious man-made material will be implemented to cover the soil piles at all times when the soil is not

being actively managed (that is, placing, sampling, or removing waste). The cover will extend beyond the bottom liner and will be secured so that the staging pile soils are not exposed to the wind, precipitation, or elements. The cover will be constructed of impervious material sufficient to withstand site conditions (that is, sun, wind, cold, heat, and movement to expose/cover the working face). Waste will not be added or removed during inclement weather (that is, periods of precipitation and/or high winds). Incompatible wastes will not be stored in close proximity. Soils in the waste staging piles will be managed in a manner that will eliminate any potential run-on/run-off from entering the staging pile, or run-off from contacting the soils, thus eliminating the need to contain run-off. Waste staging piles will be appropriately barricaded and signed. If containers will be used for staging of solid, nonflowing remediation wastes, they will be managed in rows, and a minimum aisle spacing of 30 in. will be maintained between rows and between containers and boundaries to allow adequate inspection and maintenance. All waste staging piles and containers will be inspected weekly.

The subbase of the staging piles will be constructed of compacted gravel. The liner system could be a geosynthetic, asphalt, or concrete slab (minimum 4 in. thick). Geosynthetics could be 30-, 60-, or 100-mil-thick high-density polyethylene (HDPE) with or without a geosynthetic cushion. Compatibility between the liner material and expected wastes will be a criterion in liner selection. Covers could be a geosynthetic material (e.g., HDPE, very-low-density polyethylene, polypropylene, or hypalon) or a 15-mil scrim-reinforced HDPE. Compatibility between the cover material and expected wastes will be a criterion in cover selection. Another criterion will be the ability to withstand sustained winds of 35-50 mph with appropriate anchorage.

Containers, if used for waste staging, will be selected to ensure compatibility with the waste being managed. Wastes that may be managed in containers include soil, containerized debris such as equipment, tank system components, and piping. The containers will be managed to enable inspection and ensure no releases are associated with their management.

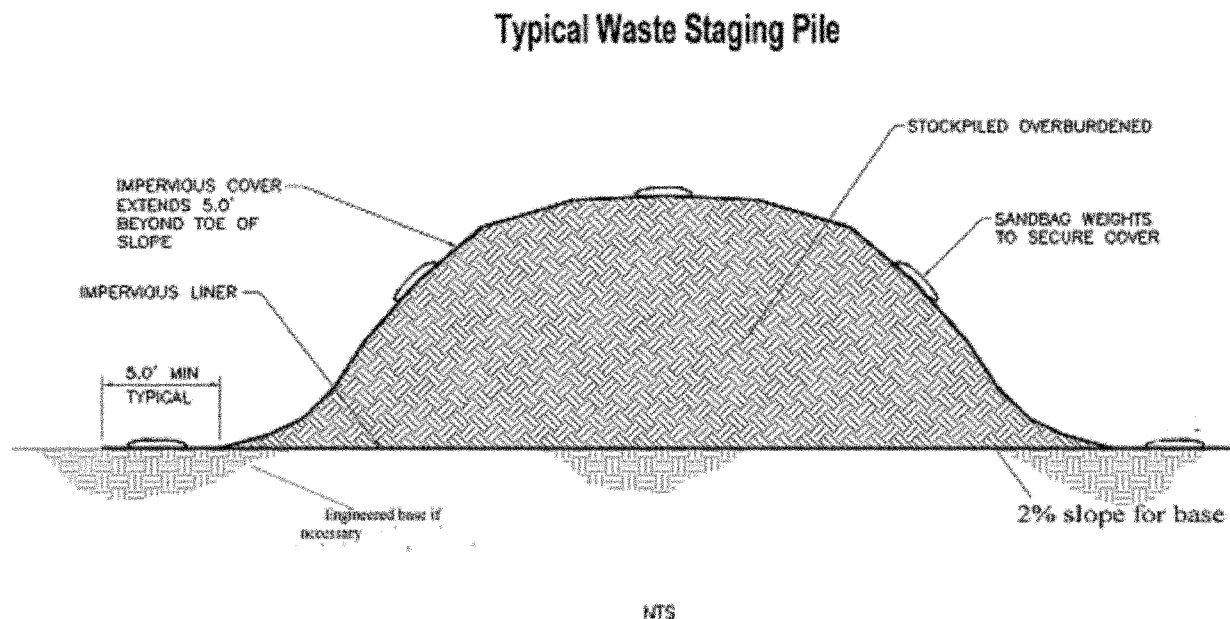


Figure 11-1. Cross section of typical waste staging pile.

## 12. TRACKING, REPORTING, AND RECORDKEEPING

Information pertaining to the waste characteristics, waste generation and storage locations, disposition plans, and waste shipments for contaminated (hazardous and/or radionuclide) CERCLA wastes and nonroutine CERCLA IW generated at the INEEL is maintained in an electronic database called the IWTS. IWTS Material Profiles are developed to provide characterization information specific to a particular waste stream. As the waste is generated, specific information pertaining to individual containers of waste is reported in individual IWTS Container Profiles. The information in the IWTS Material Profiles and Container Profiles is certified by a WGS WTS that the HWD has been performed and that the information is complete and accurate based on the analytical data or process knowledge information used for characterization and that the information for the container falls within the bounds of the parent Material Profile. This information is then independently reviewed for completeness and accuracy by a different WGS WTS. Finally, the information in the Material and Container Profiles is approved by a WGS WTS authorizing WGS to disposition the waste in accordance with the disposition path defined in the IWTS Material Profile and that the waste meets the acceptance criteria of the facility or facilities where the waste will be disposed. This approval cannot be performed by the WTS performing the review.

WGS WTSs use the information in the IWTS Material and Container Profiles to ensure the CERCLA waste meets the acceptance criteria of the receiving facility. IWTS also tracks shipments of waste to various facilities using IWTS Shipping Tasks. For on-Site shipments, the receiving facility must approve shipments before they are shipped. For facilities utilized outside the boundaries of the INEEL, approval must be received from the facility before the waste can be shipped. This approval is not documented in the IWTS database but is maintained in a hard copy file with the waste characterization information.

It should be noted that not all CERCLA IW is tracked in the IWTS database. An example of IW that is not tracked in IWTS is routine office waste. This waste is placed into IW receptacles that are placarded with information pertaining to what is permissible to be placed in the receptacles. Some IW is tracked in the IWTS database to ensure the INEEL Landfill Complex is aware the waste is being shipped and that it meets the facility's acceptance criteria. An example of IW that would be tracked in IWTS is color-code material such as yellow shoe covers. Since yellow shoe covers are typically used for protection from radioactive contamination, a special profile has been prepared for color-coded PPE that has been surveyed and found not to be contaminated with radioactivity or that has been used for training purposes. Another example is empty containers where all the contents have been removed and the containers are not radiologically contaminated. IWTS Container Profiles are typically not prepared for IW because the waste is shipped to the facility in reusable receptacles or the waste is shipped in bulk shipments or noncontainerized.

CERCLA wastes that must be shipped off-Site for appropriate storage, treatment, and disposal shall meet the applicable requirements of the DOT, the receiving facility's WAC, and the Off-Site Rule (40 CFR 300.440) requirements.



### 13. REFERENCES

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**Appendix A**  
**Sampling and Analysis Plan Table**



#### Sampling and Analysis Plan Table for Chemical and Radiological Analysis

Page 1 of 1

Project Manager: FORSYTHE, H. S.

SMO Contact: KIRCHNER, D. R.

Plan Table Revision: 0.0

Project: WAG 3 TANK FARM

The sampling activity displayed on this table represents the first six characters of the sample identification number.

The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

Comments:

AT11

AT12.

AT13

AT14-

AT15:

AT18.

AT17.

AT18.

AT19.

AT20

### Analysis Suites

### Contingencies

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